SMT Alignment

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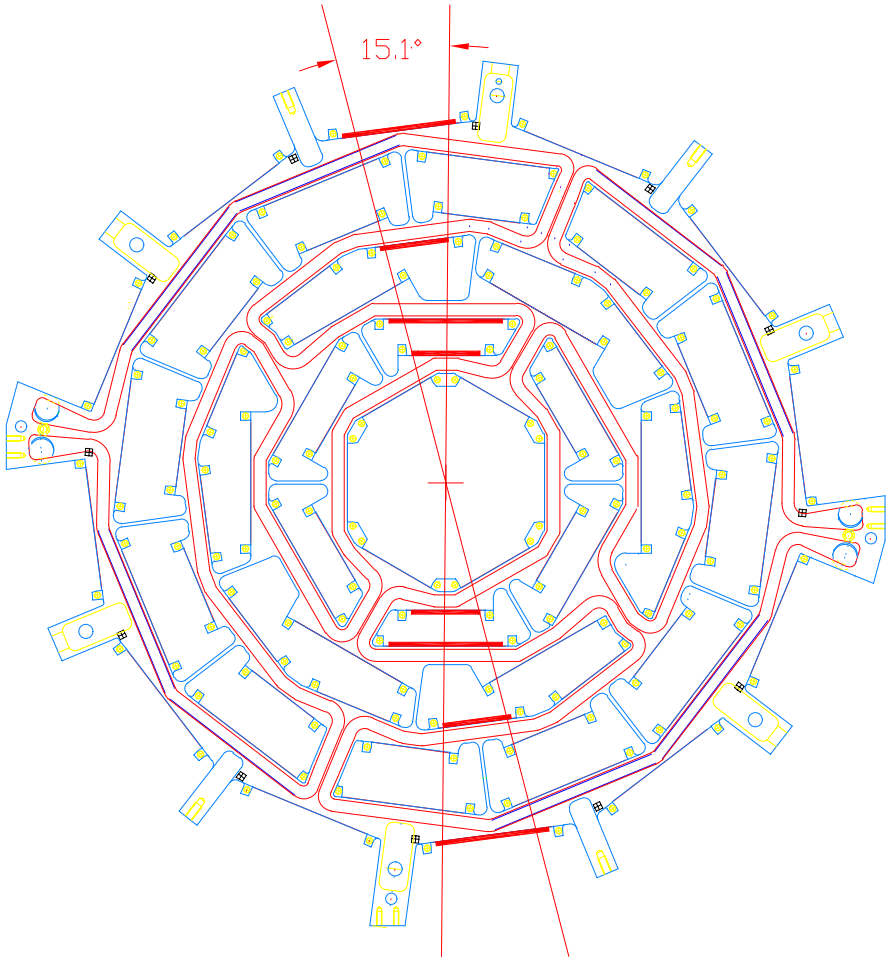
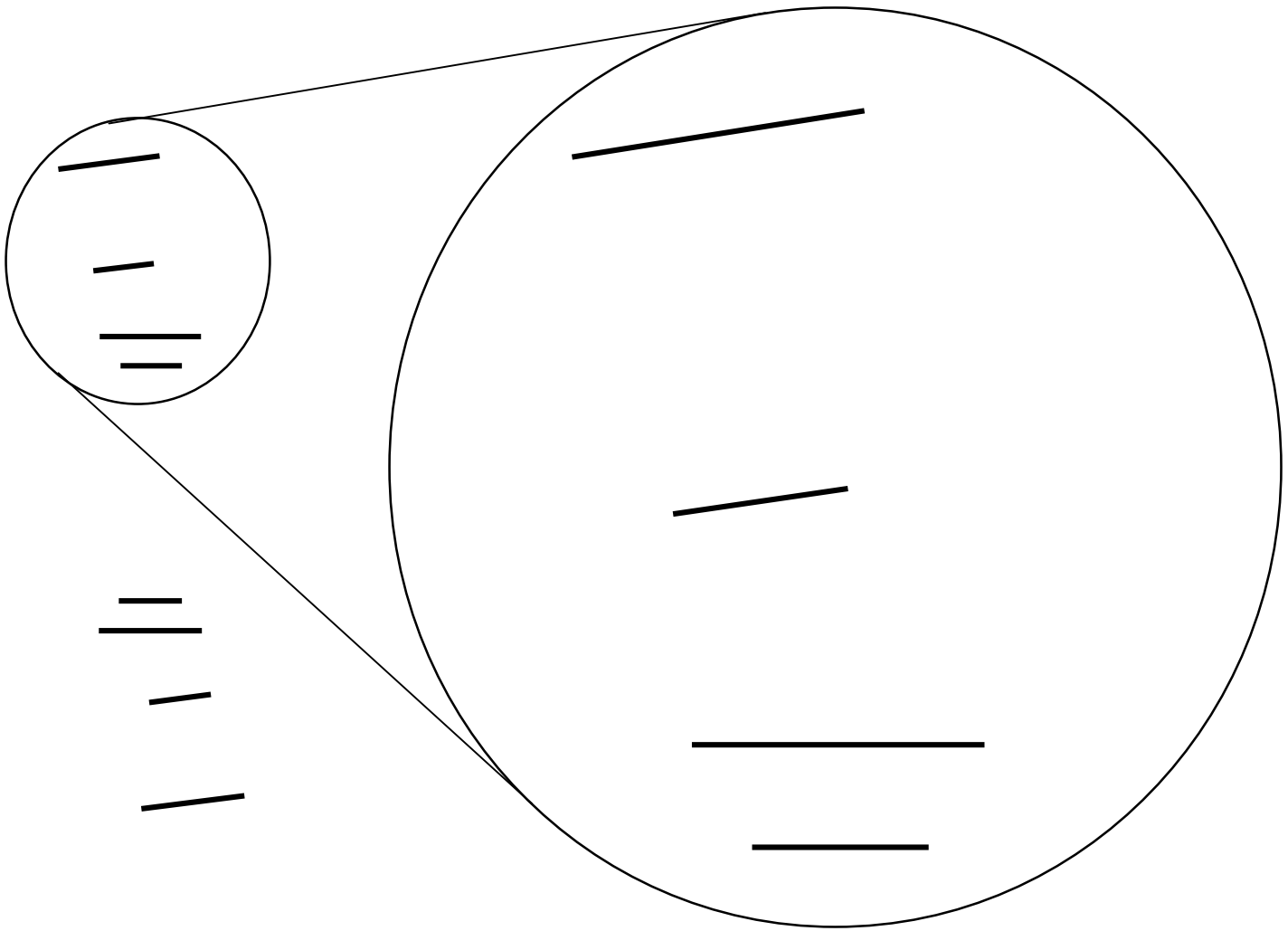
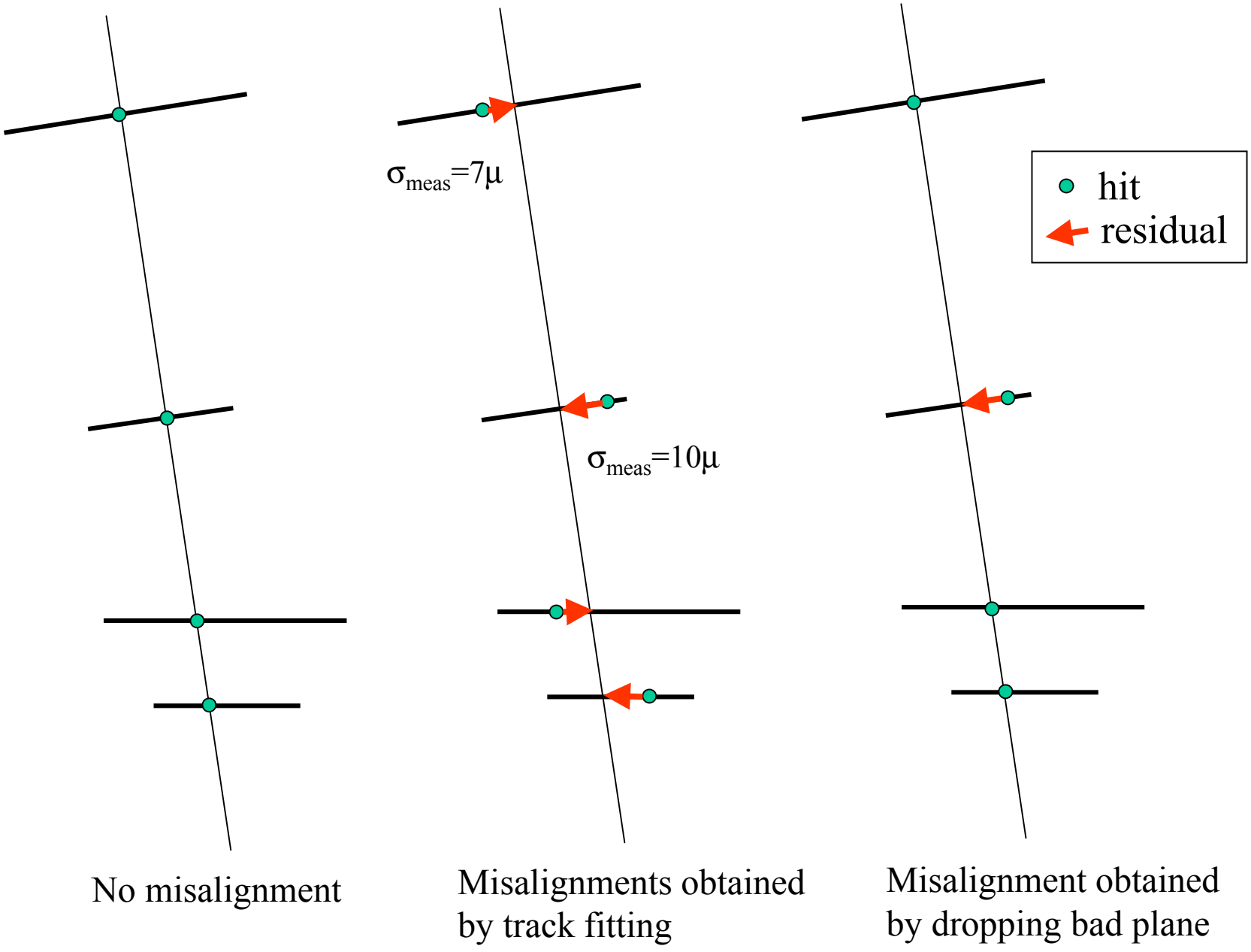
10% Test - Example Initial Configuration - Barrel 4



Layer	Ladder
8	4
5	4
3	2
2	2
2	5
3	5
5	10
8	10





No misalignment

Misalignments obtained by track fitting

Misalignment obtained by dropping bad plane

Alignment Strategies - tracking and geometry selections

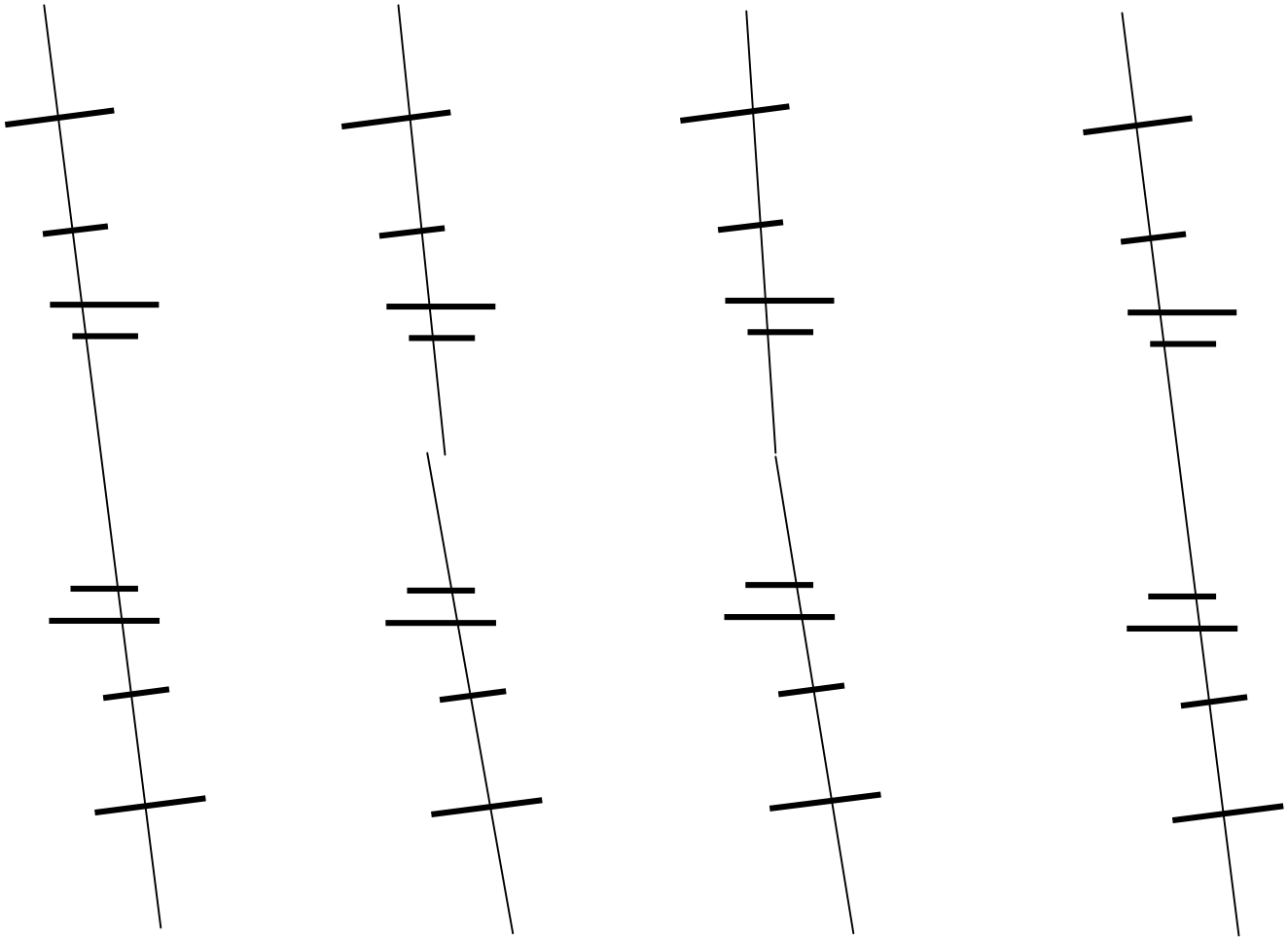
Upper four ladders: align all four relatively

- Select geometry elements for tracking
  - BarLayLad = 4202,4302,4504,4804
  - allowed missing clusters = 0
- Select geometry elements and degrees of freedom for alignment
  - BarLayLad = 4202,4302,4504,4804
  - vary = xz

Upper four ladders: track in three, align the fourth

- Select geometry elements for tracking
  - BarLayLad = 4202,4302,4804
  - allowed missing clusters = 0
- Select geometry elements and degrees of freedom for alignment
  - BarLayLad = 4504
  - vary = xz

Alignment with Constraints



Actual track

Towers aligned separately

Tracks vertex constrained

Towers constrained to single track

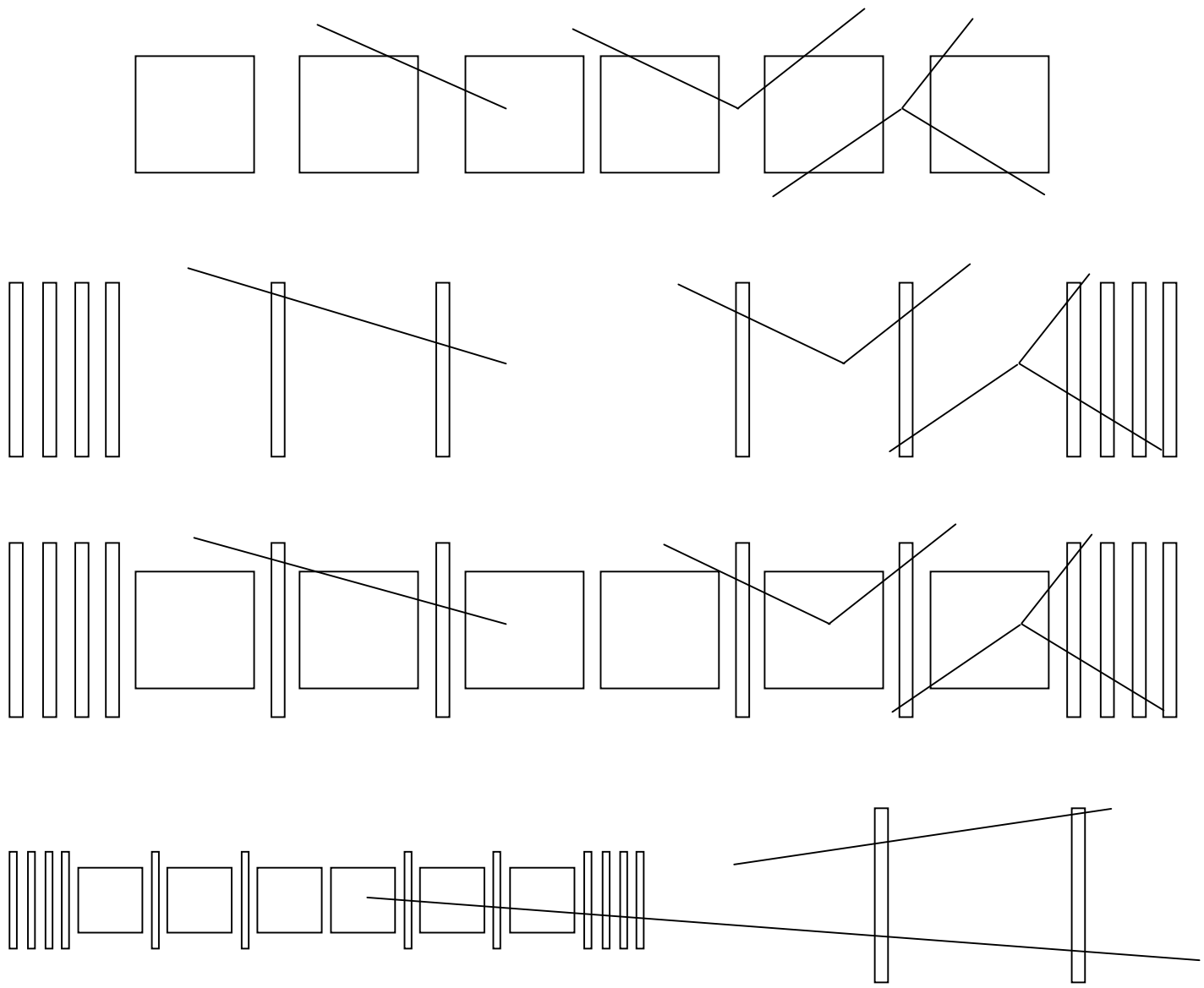
Alignment Strategies - tracking constraints

All eight ladders: align all eight with vertex constraint

- Select geometry elements for tracking
  - BarLayLad = 4202,4302,4504,4804
  - BarLayLad = 4205,4305,4510,4810
  - require one track in each, constrain to common vertex
  - allowed missing clusters = 0
- Select geometry elements and degrees of freedom for alignment
  - BarLayLad = 4202,4302,4504,4804, 4205,4305,4510,4810
  - vary = xz

All eight ladders: align to single track

- Select geometry elements for tracking
  - BarLayLad = 4202,4302,4504,4804, 4205,4305,4510,4810
  - allowed missing clusters = 0
- Select geometry elements and degrees of freedom for alignment
  - BarLayLad = 4202,4302,4504,4804, 4205,4305,4510,4810
  - vary = xz



Alignment issues from earlier discussion with Ela and Silke

- MC generation
- Trigger selection and rate
- Alignment Strategy
- Alignment Program Design
  - program requirements and design
    - use cases
    - logical flow, data flow diagrams
    - class diagrams
- Interface with geometry system
- Event reading and framework
- Residual calculation
- Alignment parameter calculation
- Displays